

**STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENT
Wildlife Disease Laboratory**

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2012 Summary of Selected Michigan Wildlife Health Issues

Report to the Fish & Wildlife Health Committee
Association of Midwest Fish and Wildlife Agencies

Updated 04/12/2012

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2011 Surveillance Report

Since 1994, the State of Michigan has recognized a problem with *Mycobacterium bovis* in wild white-tailed deer from a fourteen county area in northeastern Lower Michigan. In 2011, surveillance activities for *M. bovis* continued, with an emphasis on the 5-county area of Alcona, Alpena, Montmorency, Oscoda and Presque Isle counties in the northern half of the Lower Peninsula. There was also increased surveillance in 10-mile radii around positive deer in Cheboygan, Emmet, and Iosco counties. Seventeen white-tailed deer have cultured positive (see map) from 6,022 deer submitted for testing.

Since the index cases were first identified, over 195,000 free-ranging deer have been tested for bovine tuberculosis and 703 infected deer have been found (see table). Increasingly, the spatial epidemiology of the disease is revealing a highly focal, clustered pattern. Approximately 96% of all positive deer identified to date originated from the 5-county area. Moreover, within that area, the vast majority of positive deer were from Deer Management Unit (DMU) 452. Even within DMU 452, the spatial arrangement of cases is highly clustered, in spite of the fact that sampling effort has been relatively uniform geographically.

White-tailed deer are the maintenance host and primary reservoir for TB in the Michigan outbreak. If eradication is to be achieved, control strategies must focus on the disease in deer. Strategies for eradication of TB from Michigan wildlife continue to focus on 1) reducing deer population densities to biological carrying capacity and 2) reducing artificial congregation of deer by restriction or elimination of baiting and feeding. These strategies have been implemented through provisions of early and late firearm antlerless deer seasons, sufficient antlerless deer licenses to reduce the deer population, and by the prohibition of deer baiting and feeding in Alcona, Alpena, Montmorency, Oscoda counties, in the northern tier of townships in Iosco county, and statewide during the early antlerless seasons.

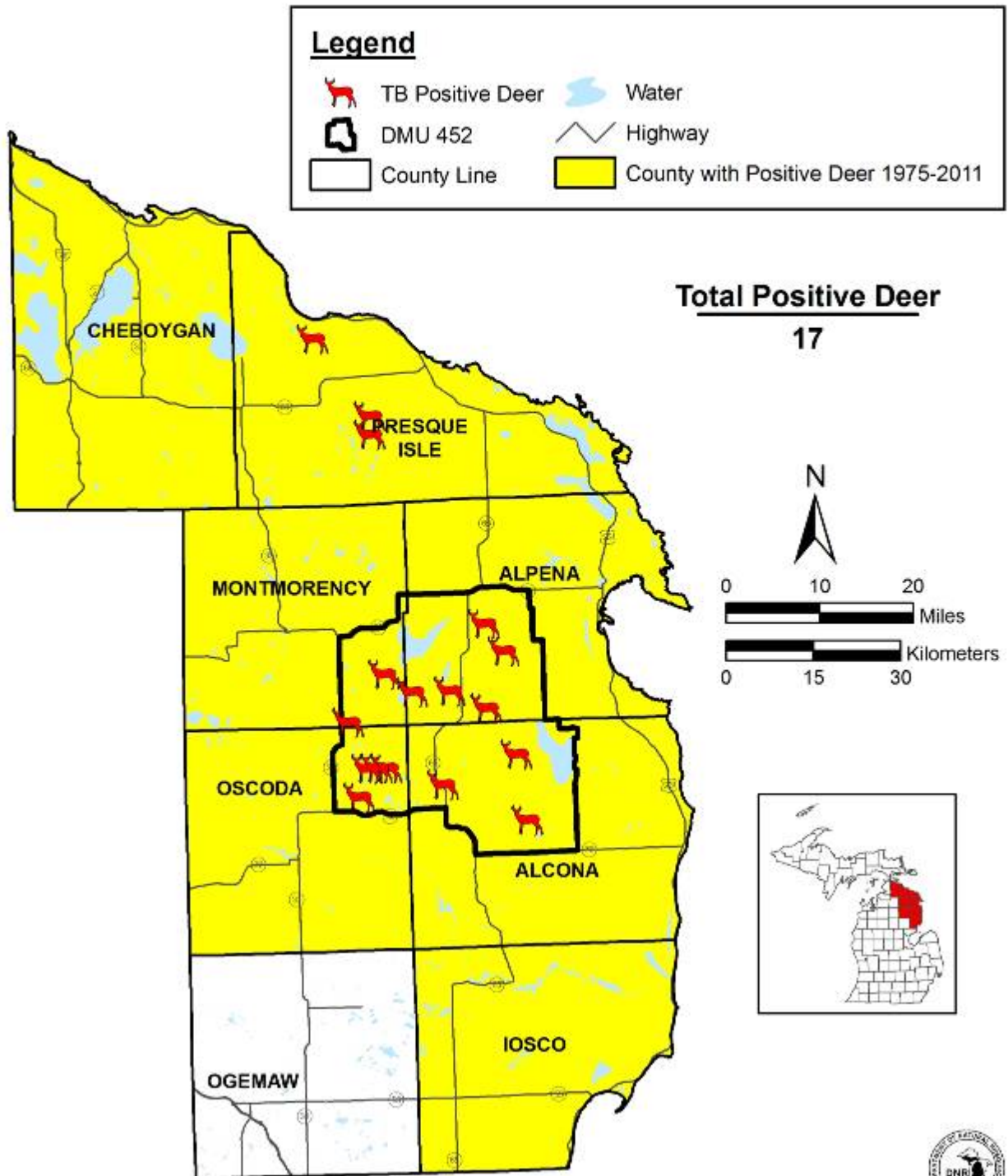
Population estimates suggest that the deer population in the five county area has declined approximately 39% from 161,415 in 1995 to 99,148 in 2009. The achievement of this substantial population reduction highlights the critical role that hunters have played in the control of TB in Michigan. Nonetheless, persistent focal areas of high density on private land remain problematic. Baiting and feeding have been prohibited in an area from which 95% of all TB positive deer have originated. The overall scope of feeding has declined dramatically since 1997, with large scale feeding largely a thing of the past. While some illegal baiting and feeding continues to occur, the size of these sites is substantially reduced, and it is hoped that heightened enforcement is expected to reduce the practice further over the next several years.

Trend analysis of prevalence data from 1995 to 2011 indicates a statistically significant decreasing trend; although, prevalence and transmission rate have been flat for the last seven years. While much work remains, substantial progress has been made towards eradication of TB from Michigan wildlife. Apparent prevalence in the core area of the outbreak DMU 452 was 1.2% in 2011. However, in 2011 there was an unexpected decline in the prevalence rate to 1.2 percent. Whether this lower level of infection persists, or the rate goes back up, remains to be seen.

The DNR is working with USDA researchers in Ames, Iowa to develop a TB vaccine for use in wild deer. Preliminary results are encouraging, and the vaccine appears to give some protection from disease. Vaccinated groups of deer given the vaccine orally or subcutaneously had statistically significantly fewer visible TB lesions and less severe TB lesions than unvaccinated deer.

In summary, Michigan is showing progress in eradicating bovine TB from its wild deer population. However, this success is fragile and we need to be diligent in maintaining our control strategies.

2011 Bovine Tuberculosis Survey Results -Cervids-



Rev. February 24, 2012

Summary of Michigan Wildlife Bovine Tuberculosis Surveillance

Michigan Department of Natural Resources – Wildlife Health Section
March 28, 2012

Initial Occurrences

In 1975 a 9 year-old female white-tailed deer from Alcona County, and in 1994 a 4 year-old male deer from Alpena County were submitted with lesions consistent with and testing positive for Bovine TB.

White-tailed Deer TB Surveillance

Year *	Number of Deer Positive	Total Deer Tested
Initial Occurrences	2	2
1995	18	403
1996	56	4,966
1997	73	3,720
1998	78	9,057
1999	58	19,499
2000	53	25,855
2001	61	24,278
2002	51	18,100
2003	32	17,307
2004	28	15,131
2005	16	7,364
2006	41	7,914
2007	27	8,316
2008	37	16,309
2009	31	5,723
2010	24	4,974
2011	17	6,022
2012 - ongoing	2 suspects	154
Grand Total	705	195,063
*Yearly surveillance includes samples collected in the field Jan. 1 st through Dec. 31 st		

Elk Surveillance

- 2,810 elk have been tested since 1996
- Five elk have tested positive
 - 1 - Montmorency 2006
 - 2 - Presque Isle, Montmorency, in 2003
 - 1- Montmorency in 2001
 - 1- Montmorency in 2000

Moose Surveillance

- 77 moose have been tested since 2003
- All have tested negative

Carnivore (Non-cervid) Surveillance

- 1,517 carnivores (16 species) have been tested since 1996
- 43 tested positive for bovine TB:
 - 19 coyotes, 8 raccoons, 7 black bear, 4 bobcat, 3 red fox, 2 opossum



CHRONIC WASTING DISEASE

Michigan's success in preventing and responding to the threat of Chronic Wasting Disease (CWD) is underpinned by rigorous surveillance, strong public education efforts, responsive scientific laboratory support, a ban on the importation of captive cervids, a CWD contingency plan and restrictions on the importation of cervid carcasses from CWD areas. From 2002 to 2008, MDNR's surveillance efforts were threefold: "Targeted" (identifying and testing free-ranging cervids statewide that show symptoms consistent with CWD), "Active" (testing of outwardly healthy cervids harvested by hunters) and "Road kill" (testing of free-ranging cervids collected as road kill).

On August 25, 2008, CWD was confirmed in a captive 3-year old white-tailed doe from a privately-owned cervid facility in Kent County. In response, the MDNR implemented the state's Surveillance and Response Plan for CWD. Provisions of this plan included a three year mandatory deer check for hunters in the nine townships in Kent County surrounding the facility from which the deer was positive as well as increased testing around the state, prohibition of the transport of all live wild cervids in the state, and an immediate ban on baiting and feeding in the Lower Peninsula of Michigan. Surveillance efforts for the past four years have been highly concentrated in and around Kent County. Since no positive free-ranging (or privately-owned) cervid has been found since the implementation of the surveillance plan, mandatory testing is no longer required in the surveillance zone and the ban on baiting and feeding has been lifted.

Since April 2002, there has been a complete ban on the importation of cervids into Michigan. MDNR will continue this ban until a reliable live animal test for CWD is developed. A Wildlife Conservation Order issued in June 2003 also prohibits the importation of hunter harvested free-ranging deer and elk carcasses from states or provinces where CWD has been found. Exceptions to the carcass ban include deboned meat, antlers, capes, and upper canine teeth.

To date 34,098 free-ranging white-tailed deer, 1,590 free-ranging elk and 70 free-ranging moose have been tested for CWD and all have been found to be negative. Michigan uses Biorad's ELISA test as a screening test for CWD and IHC (immunohistochemistry) for confirmation on retropharyngeal lymph node samples. The Michigan Department of Agriculture (MDA) has tested over 11,100 privately-owned cervids with the only positive being the privately owned white-tailed deer from Kent County.

Surveillance results to date suggest that Michigan does not have a large outbreak of the disease like Colorado, Wyoming or Wisconsin. However, there could easily be a small pocket of CWD almost anywhere in the state. Michigan will continue to perform targeted surveillance, testing any animal submitted displaying signs of a neurological disorder, on a state-wide basis.

Number of Free-Ranging White-tailed Deer Tested for CWD by Year

	2008	2009	2010	2011	Total
CWD Surveillance Zone*	1,588	786	627	146	3,147
Remainder of Kent County	356	160	130	68	714
Remainder of State	7,400	190	138	584	8,312
Total	9,344	1,136	895	798	12,173

* The CWD Surveillance Zone consists of 9 townships (Algoma, Alpine, Cannon, Courtland, Nelson, Plainfield, Solon, Sparta and Tyrone) in the northeast portion of Kent County



Rev. March 14, 2012

Summary of Michigan Wildlife Chronic Wasting Disease Surveillance

Updated December 31, 2011 by Michigan Department of Natural Resources, Wildlife Disease Laboratory

	Free-ranging White-tailed Deer Active CWD Surveillance		Free-ranging White-tailed Deer Roadkill CWD Surveillance		Free-ranging White-tailed Deer Targeted CWD Surveillance		Total White-tailed Deer Tested
Year	Number of Deer Positive	Total Tested	Number of Deer Positive	Total Tested	Number of Deer Positive	Total Tested	
1998	0	459	0	0	0	0	459
2002	0	4,305	0	22	0	46	4,373
2003	0	5,516	0	50	0	54	5,620
2004	0	6,721	0	38	0	62	6,821
2005	0	1,606	0	19	0	78	1,703
2006	0	1,460	0	9	0	73	1,542
2007	0	1,352	0	7	0	48	1,407
2008	0	9,024	0	232	0	88	9,344
2009	0	1,064	0	11	0	61	1,136
2010	0	834	0	11	0	50	895
2011	0	758	0	0	0	40	798
Total	0	32,403	0	399	0	600	34,098

TOTAL DEER TESTED- 34,098

	Free-ranging Elk Active CWD Surveillance		Free-ranging Elk Roadkill CWD Surveillance		Free-ranging Elk Targeted CWD Surveillance		Total Elk Tested
Year	Number of Elk Positive	Total Tested	Number of Elk Positive	Total Tested	Number of Elk Positive	Total Tested	
2002	0	109	0	3	0	1	113
2003	0	85	0	9	0	1	95
2004	0	99	0	8	0	2	109
2005	0	112	0	13	0	5	130
2006	0	144	0	10	0	3	157
2007	0	180	0	11	0	6	197
2008	0	251	0	8	0	10	269
2009	0	314	0	6	0	2	322
2010	0	187	0	7	0	0	194
2011	0	1	0	0	0	3	4
Total	0	1,482	0	75	0	33	1,590

TOTAL ELK TESTED- 1,590

	Free-ranging Moose Active CWD Surveillance		Free-ranging Moose Roadkill CWD Surveillance		Free-ranging Moose Targeted CWD Surveillance		Total Moose Tested
Year	Number of Moose Positive	Total Tested	Number of Moose Positive	Total Tested	Number of Moose Positive	Total Tested	
2003	0	4	0	1	0	3	8
2004	0	4	0	3	0	5	12
2005	0	1	0	4	0	2	7
2006	0	2	0	3	0	1	6
2007	0	3	0	5	0	0	8
2008	0	2	0	4	0	1	7
2009	0	2	0	7	0	0	9
2010	0	9	0	2	0	0	11
2011	0	2	0	0	0	0	0
Total	0	29	0	29	0	12	70

TOTAL MOOSE TESTED- 70



RABIES

The primary strain of rabies seen in Michigan is the bat-strain. Skunk-strain and Fox-strain rabies have also been reported in the state with the thumb area historically being an area where the skunk-strain commonly occurred. Fox-strain rabies has occurred in the past and has been detected primarily in the Upper Peninsula, the result of spill-over from Canada. Rabid red foxes have been identified throughout the state but the strain they had was bat-strain. There have been a small number of raccoons positive for rabies in the state but these were bat-strain as well.

Big brown bats are the species most commonly identified with rabies and involved with human exposures. This is a colony species that is commonly observed in building structures in the southern portion of the Lower Peninsula. In 2001 species positive for rabies in the state were: bats-41, red foxes-2, horses-2, cows-1, and cats-1. In 2002 species positive for rabies were: bats-43, striped skunks-2, and horses-1. In 2003 species positive for rabies were: bats-48, striped skunks-3, and cats-1. In 2004 species positive for rabies were: bats-36, striped skunks-3, red foxes-1, and dogs-1. In 2005 species positive for rabies were: bats-28, striped skunks-7, red foxes-1, cats-4 and sheep-1. In 2006, species positive for rabies were: bats-39, striped skunks-3, red foxes-1, horses-4, cows-1, and cats-1. Type-straining the positive terrestrial species identified North Central Skunk Strain in all the cases. In 2007, species positive for rabies were: bats-197, striped skunks-5, red fox-1, cats-2, dogs-1, and horses-1. Type straining the positive terrestrial species identified North Central Skunk Strain in all of the cases except for one skunk that was un-typed.

2007 was a record breaking year for submissions and positive results for bats in the state. At this time there is not a known explanation for this rise in bat cases.

In 2008 rabies numbers decreased to near normal historical levels. In 2008 species positive for rabies were bats-70, striped skunk-6, red fox-2 and cat-1.

In 2009, rabies numbers remained at normal historical levels. In 2009 species positive for rabies were bats-53, striped skunk-10, red fox-3 and cat-1. Michigan experienced the first human fatality to rabies since 1983. The 55 year old man was from Missaukee County in the northern portion of the Lower Peninsula. He had a history of a bat bite that was not reported and consequently the individual was not treated.

In 2010, rabies numbers once again were at normal historical levels. In 2010 species positive for rabies were bats-60, striped skunk-8, red fox-2, dog-1, cat-1, and horse-1.

In 2011, rabies numbers remained at normal historical levels. Species positive for rabies were bats-57, striped skunk-5, red fox-1, woodchuck-1, and dog-1.

Over the past eleven years, due to concerns of raccoon-strain rabies entering the state, a cooperative surveillance project with the Michigan Department of Natural Resources, the Michigan Department of Community Health, and the Michigan Department of Agriculture has resulted in neurologically abnormal raccoons being collected and submitted for rabies testing and necropsy. County or City Animal Control agencies and DNR personnel have been involved in these collections. To date, none of the raccoons submitted have been positive for rabies and Canine Distemper has been suspected or proven to be the cause of the animal's abnormal behavior.

Legend

- Skunk = 5
- Bat = 57
- Woodchuck = 1
- Dog = 1
- Fox = 1

Total = 65



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Type E Botulism

Botulism is a paralytic condition brought on by the consumption of a naturally occurring toxin produced by the bacterium *Clostridium botulinum*. The toxin produced during growth of the bacterium is one of the most poisonous substances known. There are 2 types of botulism detected in wildlife, Type C and Type E. Type C occurs in bottom sediments and occurs annually in Michigan. Type E botulism is associated with the ingestion of fish and occurs mainly in gulls, loons, mergansers, grebes, and cormorants and in Michigan has been less common. Type E botulism has become more prevalent in recent years in Lake Erie and Lake Ontario with the introduction of Zebra and Quagga mussels and round gobies (species native to the Black and Caspian Seas, which are located between Turkey and Russia). The bacterium *C. botulinum* Type E is found in bottom sediments, in aquatic invertebrates, and in the gut of fish.

Zebra and Quagga mussels feed on bottom sediments, obtaining the bacteria, and the mussels are in turn fed upon by the goby. Gobies become sick and/or die due to the botulinal toxin and the live or dead fish is then eaten by a fish-eating bird. This results in a Type E botulism die-off occurring coincidentally in fish and birds.

Type E botulism has not been commonly seen in either Lake Huron or Lake Michigan in recent years with only a few cases reported. However, in 2006, die-offs of horned grebes, red-necked grebes, common loons, double-crested cormorants, herring gulls and ring-billed gulls were reported in Lake Michigan in both the Upper and Lower Peninsulas. The die-off in the Upper Peninsula resulted in reports of approximately 500 dead birds. The die-off in the Lower Peninsula centered around Sleeping Bear Dunes National Lakeshore and resulted in an estimated mortality of 3,000 birds.

In 2007, die-offs of piping plovers, Caspian terns, horned grebes, red-necked grebes, ring-billed gulls, herring gulls, a bald eagle, white-winged scoters, Common loons and long-tailed ducks were reported on the Lake Michigan shoreline in both the Upper and Lower Peninsulas. The die-off resulted in approximately 7,500 birds dying in the affected area. The area of the die-off was greater in 2007 than it was in 2006 with at least additional counties in the Lower Peninsula and one more county in the Upper Peninsula involved.

In 2008, die-offs were significantly lower than in previous years and included Benzie, Leelanau, Emmet, Mason and Oceana Counties. Approximately 150 birds were involved in the 2008 die-offs, including ring-billed gulls, herring gulls, double-crested cormorants, common loons, terns and a teal. In recent years, increases in *Cladophora* algae, mussel and goby populations in Lake Michigan have been observed with this combination of factors likely resulting in mortality due to Type E Botulism becoming an annual event.

In 2009, die-offs were consistent with what was observed in 2008 and included Benzie, Leelanau and Mason Counties. Approximately 175 birds were involved with the 2009 die-offs and species involved were a common goldeneye, common merganser, double-crested cormorants, herring gulls, ring-billed gulls, Caspian terns, and a common loon.

In 2010, die-offs of common loons, double-crested cormorants, herring gulls, horned grebes, red-necked grebes, ring-billed gulls, spotted sandpipers, white-winged scoters, long-tailed ducks, red-breasted merganser and American coot were reported on the Lake Michigan shoreline in both the Upper and Lower Peninsulas. The die-off resulted in approximately 3,000 – 4,000 birds dying in the affected area. This was the highest mortality observed since the record number of 7500 dead birds in 2007.

In 2011, die-offs of common loons, double-crested cormorants, ring-billed gulls, herring gulls, white-winged scoters, long-tailed ducks, and red-breasted mergansers were reported on the Lake Michigan shoreline in both the Upper and Lower Peninsulas. The die-off resulted in approximately 335 birds dying in the affected area.



Epizootic Hemorrhagic Disease

Epizootic Hemorrhagic Disease (EHD) is an acute, infectious, often fatal disease contracted by wild ruminants but most commonly affecting white-tailed deer. The (EHD) virus is classified as an Orbivirus. EHD is transmitted via the bite of an infected insect of the genus *Culicoides* which include midges, gnats, and other biting flies. The disease cannot be transmitted from one animal to another by direct contact, and it is not transmissible to humans. EHD typically is detected in deer in late summer and early fall and such dead deer are oftentimes found near water.

Deer infected with the virus appear lethargic, disoriented, lame, and unresponsive to humans. As the disease progresses, the deer may have blood-tinged discharge from the nose and mouth along with sores in the mouth and a swollen tongue. Deer usually develop a high fever (they seek out water to decrease their body temperature - that is why they are found near or in water) and the vascular system is affected. Hemorrhages are commonly present throughout the viscera and blood is found in the body cavities.

In 2006, EHD was diagnosed in two white-tailed deer (one free-ranging and one privately owned) in Allegan County in the southwestern portion of the Lower Peninsula. Numerous reports were received concerning dead deer in an area encompassing the Kalamazoo River, Rabbit River, and Potawatomi Marsh. The deer exhibited lesions consistent with an EHD infection and the disease was confirmed via virus isolation.

Although EHD occurs annually in many states in the U.S., it has only been reported in Michigan twice prior to 2006; in 1955 and in 1974. In both of these die-offs, approximately 100 white-tailed deer were involved. The estimate for the EHD die-off in 2006 was 50 – 75 deer.

In 2008, EHD was diagnosed in deer from the southeastern portion of the state near the Clinton River in Macomb and Oakland Counties. An estimated 150-200 deer were involved in this die-off.

In 2009, EHD was diagnosed in deer from the southeastern portion of the state near Ore Creek in northeastern Livingston County. An estimated 300-450 deer were involved in this die-off. The virus serotype that was isolated from the deer was different than the one identified in 2008 (EHDV-2) and 2006 (EHDV-2).

In 2010, EHD was diagnosed in deer from the southwestern portion of the state with the counties of Allegan, Berrien, Cass, Ottawa, St. Joseph, and Van Buren involved. An estimated 1125 deer were involved in the die-off.

In 2011, EHD was once again diagnosed in deer from the southwestern portion of the state with the counties of Cass and St. Joseph involved. An estimated 300 deer were involved in the die-off.



[illegible]

FERAL SWINE SURVEILLANCE IN MICHIGAN

The DNR has established a partnership with the Natural Resources Conservation Service (NRCS) to pilot a swine trapping program in Midland, Bay, Arenac, and Gladwin counties. These trapping efforts are in addition to a feral swine trapping program undertaken by the United States Department of Agriculture-Wildlife Services (USDA-WS) that began in 2009 and are on going. The USDA-WS trapping program is focused on swine trapping on public and private land with high incidence of swine sightings.

In May of 2010, the Michigan legislature passed a law allowing swine running at large to be killed on public and private land. Hunters with a valid Michigan hunting license of any type or a concealed pistol permit are encouraged to shoot feral swine. This change provided much greater flexibility for the public to participate in the lethal control of feral swine. This legislation also declared that swine running at large are a public nuisance. Michigan agencies have received numerous e-mails and phone calls from Michigan and non-Michigan hunters requesting reported locations of feral swine and requirements to pursue them.

In December of 2010, the DNR issued Invasive Species Order Amendment 1 of 2011 declaring feral swine (also known as wild boar/hog, feral pig/hog, razorback, Old World swine Eurasian wild boar, Russian wild boar) be an invasive species in an effort to eliminate source populations. The order took affect in October of 2011 and the deadline for dispossessing these invasive swine species is April 1, 2012. The DNR also issued a Declaratory Ruling (provided in the DNR Administrative Rule 299.3095) to clarify the “exact standards that MDNR will be utilizing to determine the hybrid, genetic variants, and offspring of prohibited swine.”

The DNR began tracking sightings and damage of wild swine in 2001 and developed and maintains a website that serves as a repository for information on wild swine (www.michigan.gov/feralswine). Additionally, posters advising the public to shoot swine running at large were distributed to all DNR license agents.



2010 Mecosta County

As of 3/16/2012:

- Feral swine have been reported sighted or killed in **74 of 83** counties.
- Swine roaming in groups of two or more animals have been reported in **54** counties: **49** in the Lower Peninsula and **5** in the Upper Peninsula.
- Property, agriculture, or habitat damage due to feral swine has been reported in **32** counties.
- **324** feral swine have been shot in **53** counties: **48** in the Lower Peninsula and **5** in the Upper Peninsula.
- **50** pigs were reported killed in 2009, **39** in 2010, **45** in 2011, and **13** thus far in 2012.

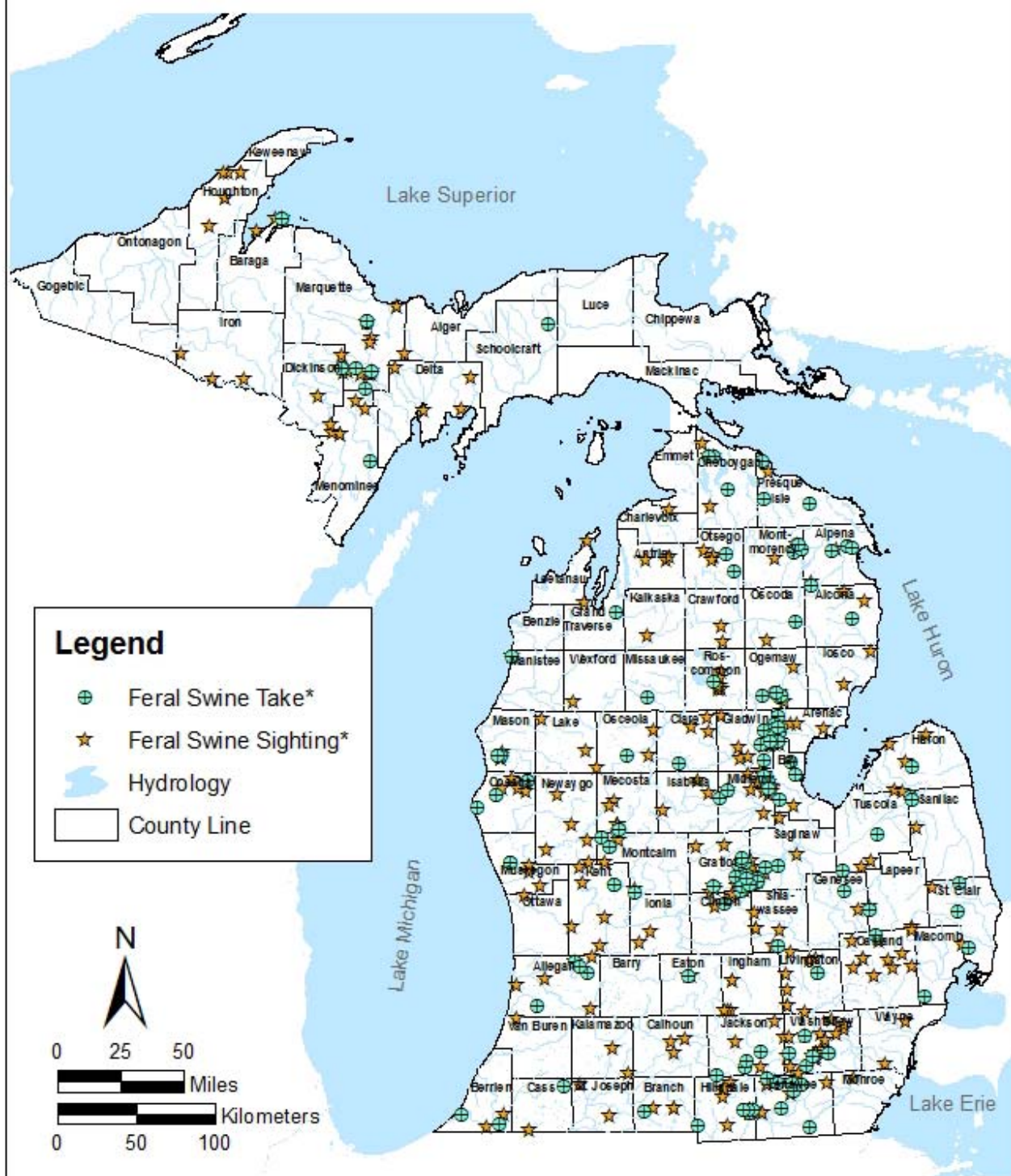
Tissue and/or blood samples have been collected for disease testing from **111** animals (2007-2012). Because we rely on passive surveillance from hunters and others who submit feral swine, samples received are not always complete or in good condition. Therefore, not all feral swine submitted for disease surveillance have been tested for all diseases possible. Depending on the available samples, tests can be run for the following diseases of concern: classic swine fever, swine brucellosis, pseudorabies (PRV), bovine TB, trichinosis, toxoplasmosis, swine influenza, Hepatitis E, Porcine Reproductive and Respiratory Syndrome, and leptospirosis.

One (n=8) sample tested positive for PRV in 2010, **1** (n=14) in 2011 and no (n= 11) samples tested in 2012 thus far have been positive for PRV. All other feral swine disease testing for those years have been negative.



2011 Ottawa County

Michigan Feral Swine Sightings and Take



*Not all sightings and take locations are shown due to incomplete information



Rev. April 12, 2012

White-nose Syndrome in Bats

During the winter of 2006–2007, an affliction dubbed “white-nose syndrome” (WNS) began devastating colonies of hibernating bats around Albany, NY with high mortality. White-nose syndrome was named for the visible white fungus around the muzzles, ears, and wing membranes of affected bats. A previously unreported species of cold-loving fungus (*Geomyces destructans*) has been identified as the likely causal agent. During 2010, development of the Michigan WNS Response Plan, lead by MDNR, was undertaken as a state and regional cooperative effort. Its purpose is to mitigate to the extent possible the effects of WNS on Michigan bats by 1) preventing mechanical spread of *G. destructans* into and around Michigan by humans; 2) purposefully conserving bat populations (and their habitat) remaining after the disease has arrived and die offs occur; and 3) provide an organizational framework by which effective and feasible WNS control measures can be implemented in the future, should any ever be identified. The detailed plan is publicly available at http://www.michigan.gov/documents/emergingdiseases/MichiganWNSPlanFINAL122010_342261_7.pdf .

Winter surveillance (in cooperation with Eastern Michigan University) in 2011 targeted bat hibernacula at or near tourist mines and active iron and copper mines, as well as sites along the northwest shores of Lake Huron. These latter sites lie closest to confirmed *G. destructans*-infected sites in Ontario. In addition, previously unsurveyed mines in Keweenaw, Gogebic, Marquette and Ontonagon Counties were investigated to assess whether they currently support bat colonies and for ranking as critical bat habitat. In all, three of the four known tourist mines in the Upper Peninsula were surveyed in winter 2011, plus a state-owned, publicly-accessible mine in Porcupine Mountains State Park, Ontonagon County. There was no evidence of bat mortality or unusual behavior that could be consistent with WNS at any of the sites surveyed.

Five live bats considered suspects for WNS (based on the presence of fuzzy, white material on the skin) were euthanized and submitted to the DNR Wildlife Disease Lab for diagnosis. Two bats (one little brown bat [*Myotis lucifugus*] and one big brown bat [*Eptesicus fuscus*]) were from the Rockport quarry in Alpena County. Three others, all little brown bats, were from the Iron Mountain Tourist Mine in Dickinson County. All five were tested by polymerase chain reaction and fungal culture for *G. destructans* by the Michigan State University Diagnostic Center for Population and Animal Health (DCPAH), following procedures developed by the National Wildlife Health Center (NWHC) in Madison, WI. All were negative for *G. destructans*. Skin samples from the most affected bat were also submitted for histopathology. Results were inconsistent with WNS according to the criteria of Cryan et al. 2010. Any samples eventually diagnosed *G. destructans*-positive at DCPAH will be submitted to NWHC for confirmation.

There were no reports from the public of unusual winter bat behavior that could be consistent with WNS via either the DNR’s Sick or Dead Wildlife Reporting Form (http://www.michigandnr.com/diseasedwildlifereporting/disease_obsreport.asp) or contacts with DNR field offices.

Despite the failure of 2011 winter surveillance to identify any *G. destructans*-infected sites, it is nonetheless assumed that WNS will eventually arrive in Michigan. Consequently, going forward emphasis will remain on outreach and education to prepare the public for WNS outbreaks and improve passive surveillance, as well as surveillance to detect introduction of the disease as soon as practical; and to characterize bat habitat so that locations and descriptions of critical hibernacula are documented for conservation purposes.



Healthy little brown bats (*Myotis lucifugus*), Dickinson County, Michigan. Photo: D. O'Brien, MDNR